Samsung AutoCache 4.0 for VMware

Using flash devices to remove I/O bottlenecks for greater VM density and efficiency

Greater VM density, efficiency and performance

AutoCache™ is a complete host-based I/O caching solution designed specifically to accelerate business-critical applications in physical and virtualized servers by using SSDs and DRAM as a local cache. It works with both virtual and physical operating systems. AutoCache supports write-back caching as well as read caching.

AutoCache 4.0 for VMware works with the VMware ESXi™ 6.0 U2 vSphere® API for I/O Filtering (VAIO) and increases VM density per host. Depending on the workload, AutoCache 4.0 for VMware increases VM density by up to two to three times and increases business-critical application performance by up to four times while maximizing system resource usage and freeing up CPU cycles to support more business applications. AutoCache is incredibly easy to deploy, by virtue of being totally transparent to system operation and fully integrated with native management infrastructure for the hypervisor. It requires no guest OS agents and no changes to current storage processes such as backup, snapshot or replication services.

AutoCache 4.0 for VMware benefits

- Up to three times greater VM density per server
- Up to fourfold increase in application performance
- Reduction in TCO
- Role-based administration
- Incredibly easy to deploy with minimal impact on IT infrastructure

AutoCache key features

VMware ready

AutoCache fully supports VMware VAIO to enable virtual data services. It supports all VMware value-added features such as VAAI, vMotion, HA, DRS, DPM, and VAIO.

Dynamic caching system

Read, write and DRAM cache space is dynamically allocated to new virtual machine disks. This guarantees that cache space is used optimally between disks.

- Single-node read caching and multi-node write-back caching
- Support for VMware vSphere VAIO I/O filters
- No agents for guest OSs
- Seamless integration with hypervisor management infrastructure that supports block and NFS data storage
- Support for any SSD (NVMe, PCIe, SAS or SATA)
- Redundancy across multi-SSDs
- Adaptive caching
- Support for separate read and write cache devices
- Cache persistence across VM reboot
- Cache fast warm feature
- Cache remote host access feature that avoids performance disruption during vMotion™ migration
- Compression and De-duplication for Cache data

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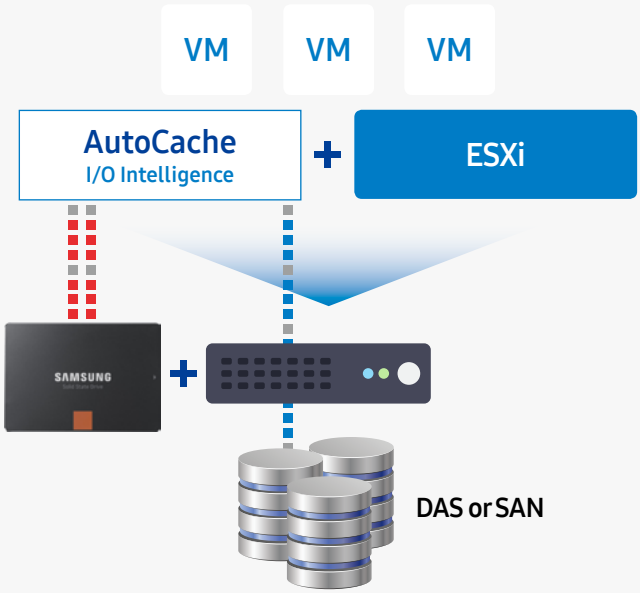
Accelerate business-critical applications

Intelligent use of SSDs in virtualized servers

AutoCache 4.0 for VMware attaches inside standard hypervisors, where it inspects all I/O from all virtual machines and places hot I/O into a combination of SSD and DRAM. Embedded intelligence supplies hot reads back to the VMs that request them, without requiring any system administrator's effort to modify the deployed storage or VM infrastructure.

AutoCache creates a unified cache for all VMs on a host that adapts automatically to the changing workloads of the environment. It shifts cache resources on the fly to VMs that most need them, as defined by a set of sophisticated, concurrently running algorithms. For example, even as AutoCache is supplying hot reads to a business-critical application on one VM, it can also prevent backup I/O on another VM from evicting other hot data from the cache, thus preserving valuable flash resources. AutoCache also supports any datastore, whether connected by block protocols or NFS (network file system). It supports both single-node read caching and multi-node write-back caching.

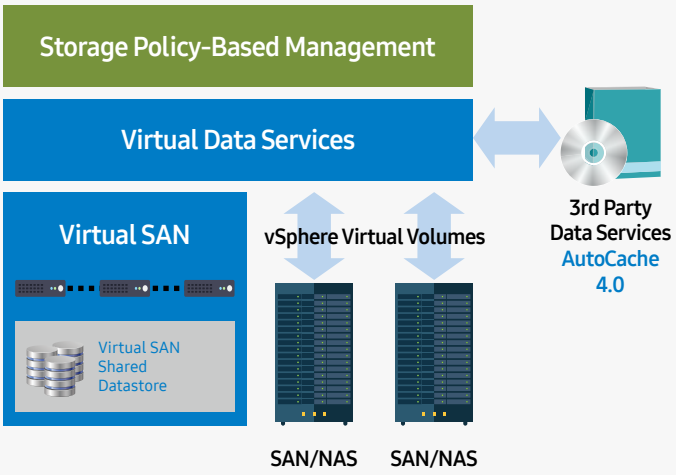
AutoCache 4.0 for VMware optimizes performance by leveraging the latest solid state technologies from Samsung and other leading vendors. AutoCache has the intelligence to unleash the performance of flash by efficiently managing the I/O blender that virtualized servers create.



Full integration with VMware VAIO I/O filters

AutoCache 4.0 for VMware is one of the first solutions to fully support VMware VAIO to enable virtual data services. Key benefits of AutoCache combined with VAIO include:

- **Finer control:** Data service operations can be executed at VM granularity rather than at LUN/volume level. AutoCache enables each VM to receive the precise number of necessary data services.
- **Policy management through SPBM integration:** Policies can be created and managed at the hypervisor level using SPBM (storage policy-based management). AutoCache supports these policies and can combine software-based data services provided by VAIO in addition to native capabilities provided by Virtual SAN™ or a storage array.
- **Storage agnostic:** AutoCache is agnostic of the storage implementation and can support Virtual Volumes™-enabled storage and traditional storage devices.



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Enhance management

Simplified management and reporting

AutoCache 4.0 for VMware integrates into existing management interface workflow such as the VMware vSphere client, vCenter™ server. AutoCache 4.0 for VMware is designed to have minimal impact on IT operations. It simply installs without re-booting of hosts to automatically give the option of autocaching for all or a portion of the various environments on the server.

Role-based administration

AutoCache 4.0 for VMware supports role-based administration, which allows administrators to create specific access rights through an easy-to-use interface. AutoCache allows setting varying degrees of AutoCache rights on a user basis rather than a machine basis, enabling users to control the caching for their individual VMs. Administrators and their users can modify both host- and VM-level cache settings, giving them the flexibility to assign different system, VM and AutoCache access privileges. AutoCache also collects usage data, allowing the previous month's data to be exported for billing purposes.

Analytics

AutoCache 4.0 for VMware provides extensive analytics to quantify performance gains through intuitive yet powerful multilayered reporting, offering insight into resource utilization, I/O workloads and cache benefits. Reporting is available per host, per cached device and per guest virtual machine. Both real-time and historical data are presented in the management interface.

AutoCache 4.0 for VMware features

Advanced feature support	All VMware value-added features such as VAAI, vMotion, HA, DRS, DPM and VAIO
Caching algorithms	Multiple adaptive algorithms that self-tune to workload
Supported guest operating systems	All, requiring no guest OS agent
Caching media	Leading enterprise SSD products with SATA, SAS, or NVMe interface
Supported storage protocols	Fibre Channel, FCoE, iSCSI, and NFS, with DAS or SAN connectivity
I/O cache types	• Write-back cache • Read cache with write-through
I/O caching attach point	Hypervisor (not guest OS)
Management	VMware vCenter plug-in

Minimum system requirements

Operating system	VMware ESXi 6.0 (u2 and later) and 6.5
Processor	64-bit x86 processor with a minimum of 4 cores
DRAM	Minimum size: 32 GB
SSD	Minimum size: 64 GB

Legal and additional information

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Autocache is currently available for enterprises and businesses worldwide, as well as small and medium size data centers.

For further information and for Autocache related inquiries, please visit our website at: http://www.samsung.com/semiconductor/support/tools-utilities/AutoCache/.

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2017-08

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